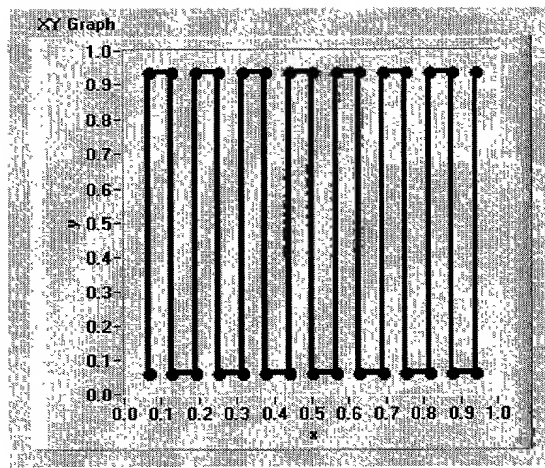


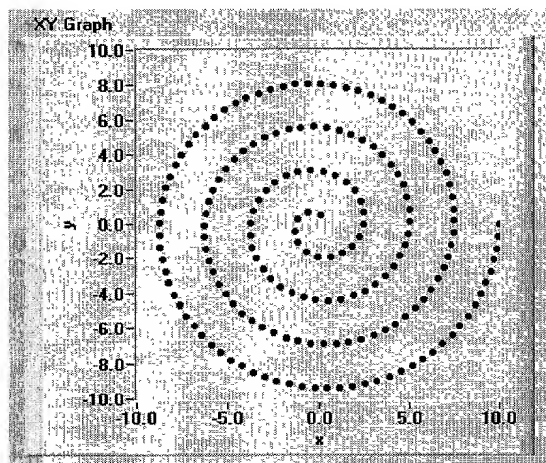
Approximated Peano Curve. The space-filling process has not been completed.

Figure 1A (Prior Art)



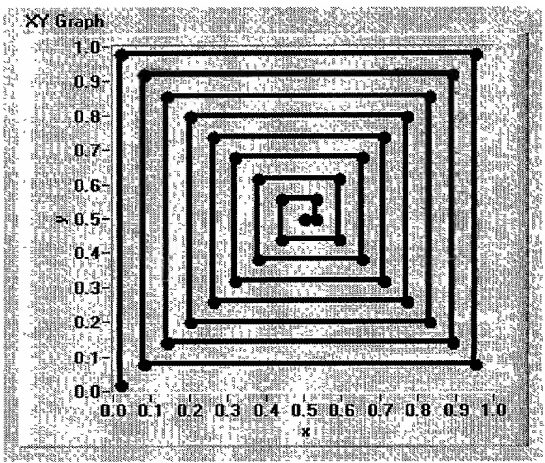
Boustrophedon Path

Figure 1B (Prior Art)



Archimedes Spiral defined by equally distributed points

Figure 1C (Prior Art)



Spiral-like line-based scanning

Figure 1D (Prior Art)

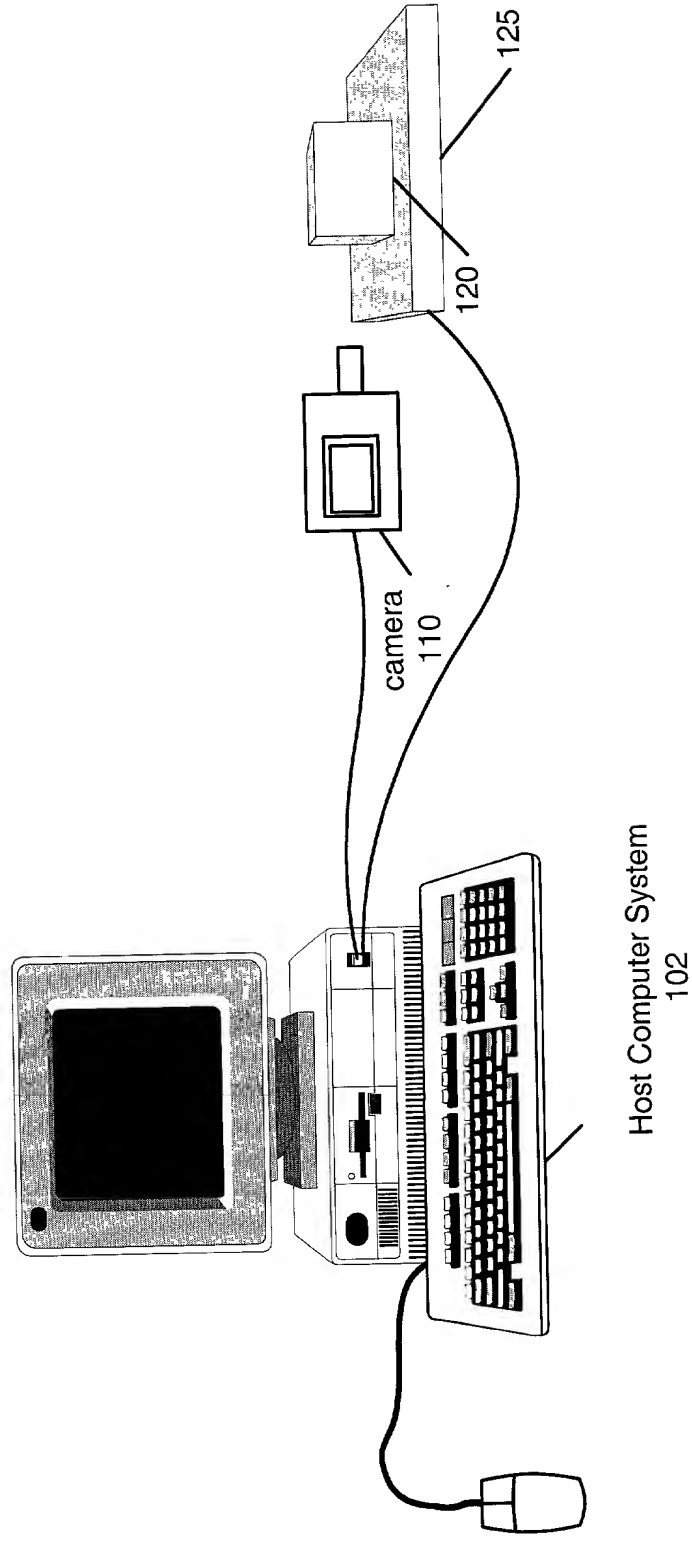


Figure 2A

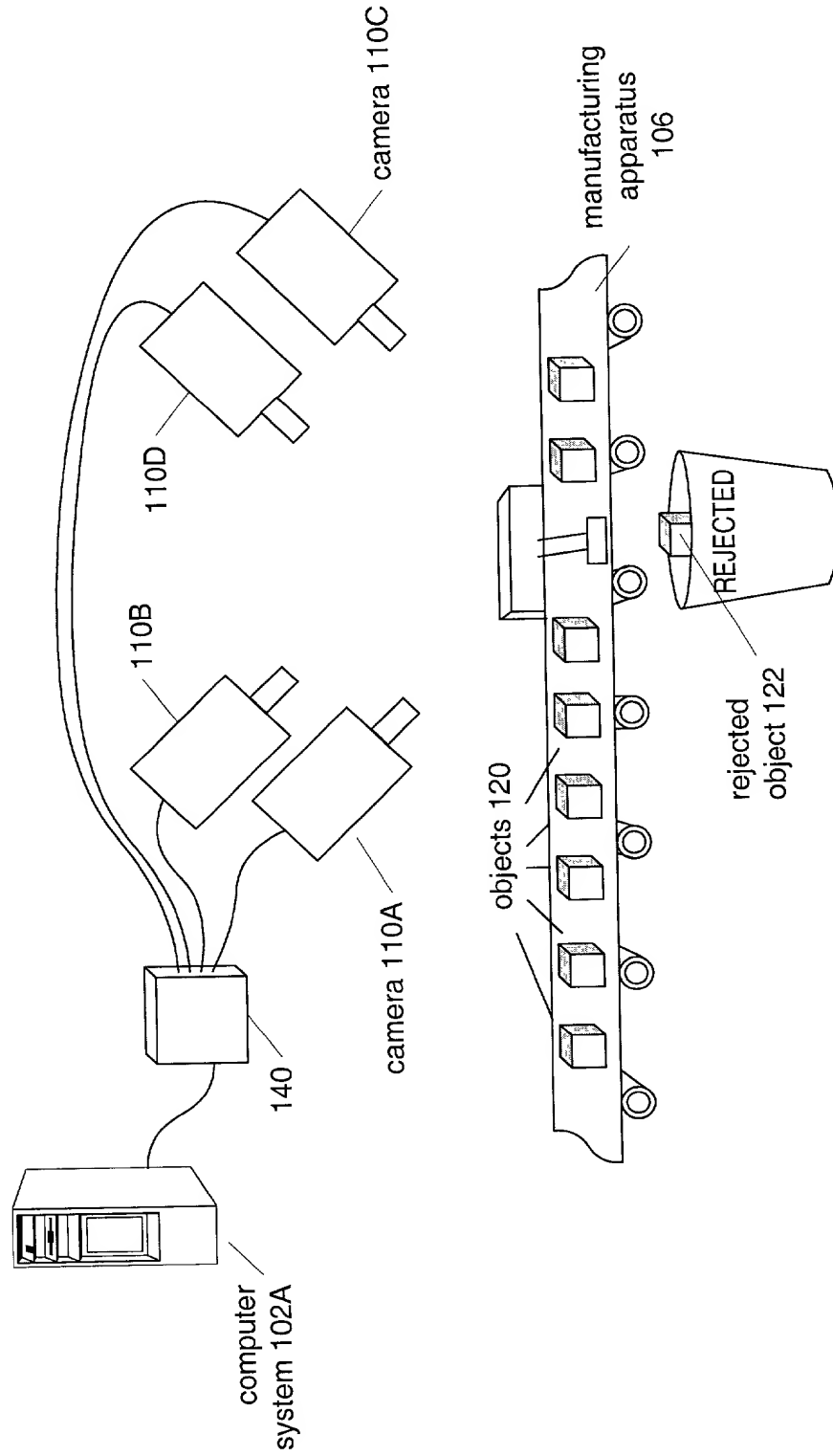


Figure 3A

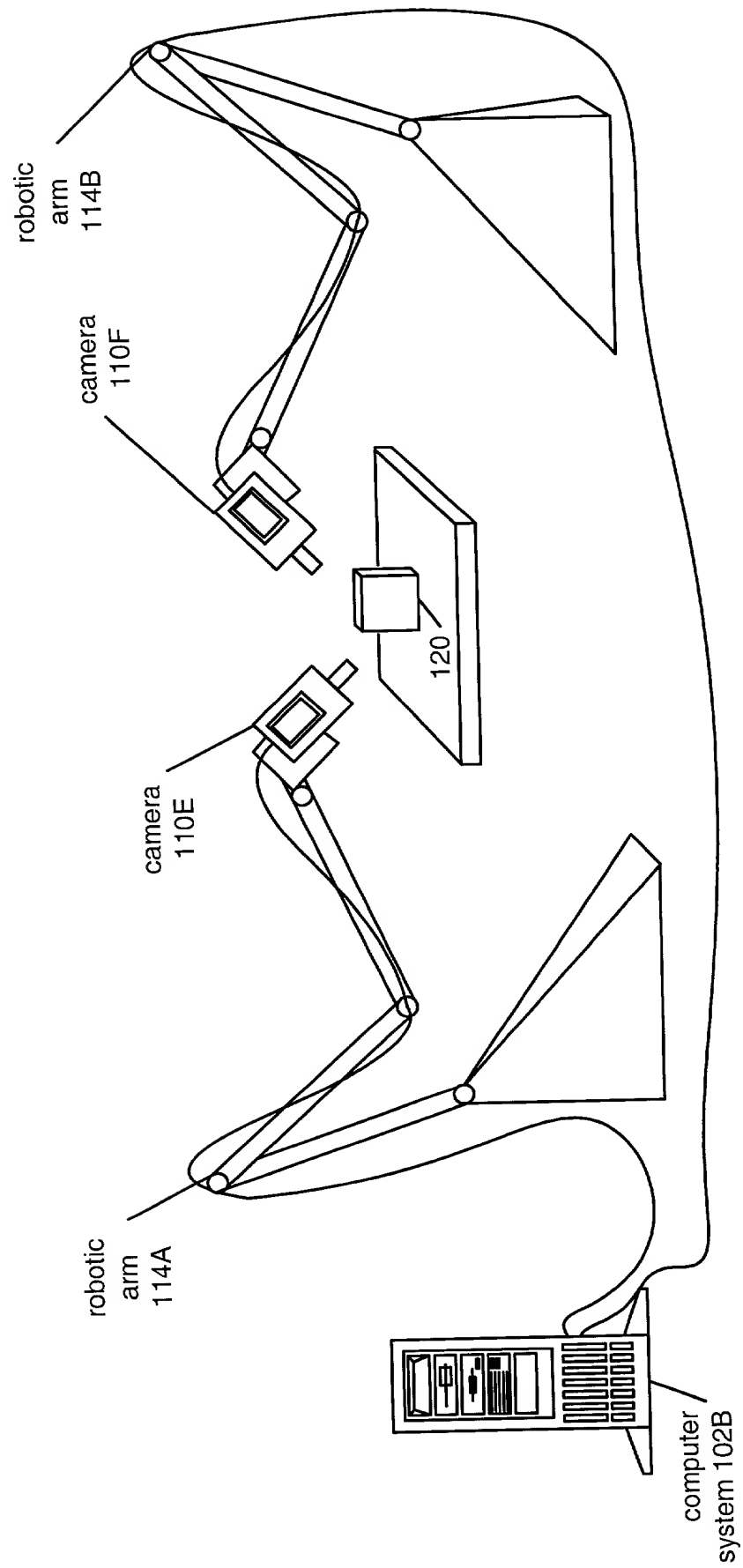


Figure 3B

09076983 0608001

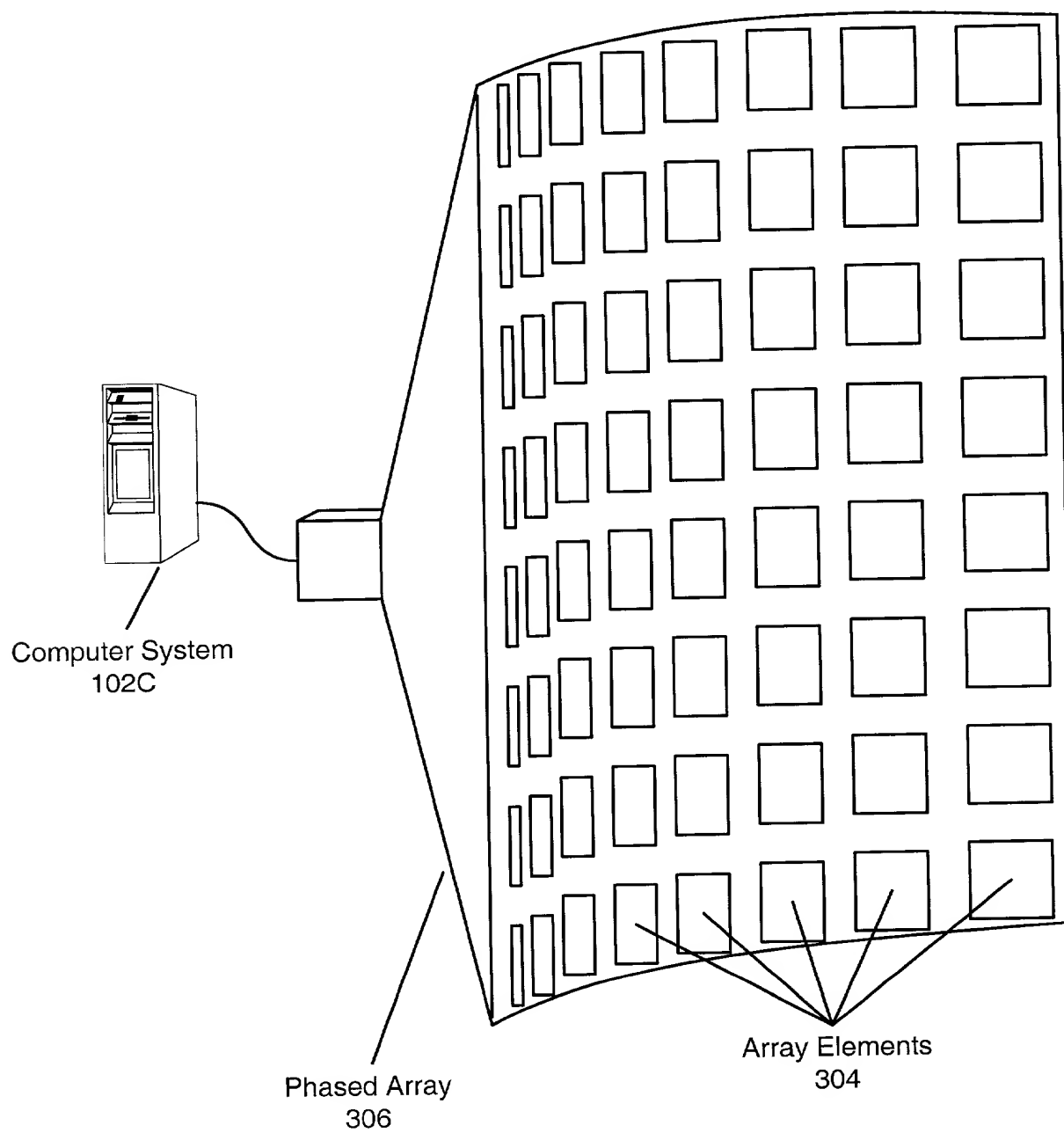


Figure 3C

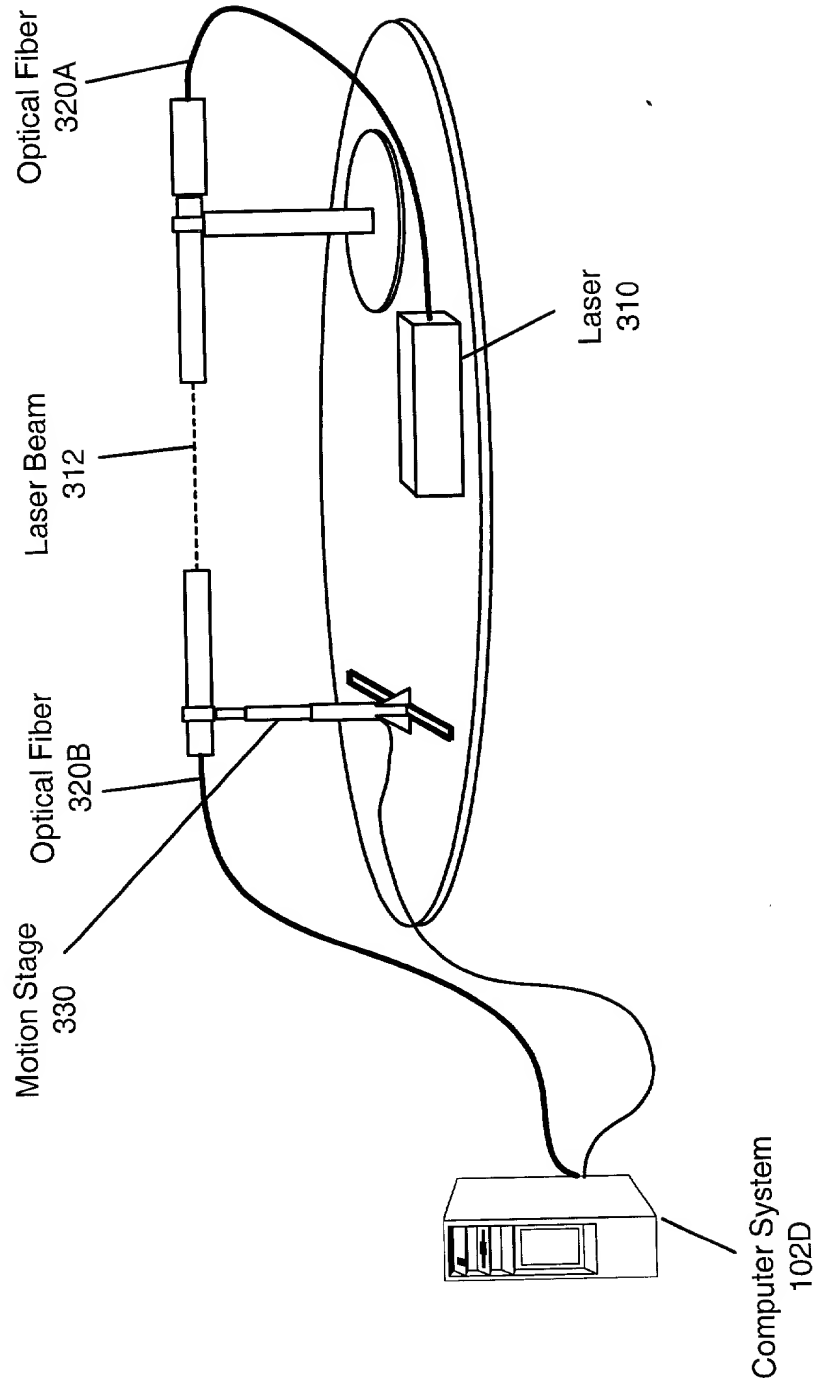
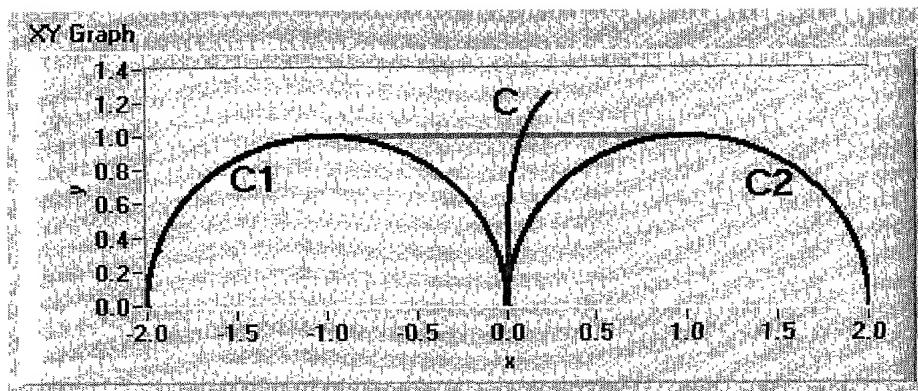


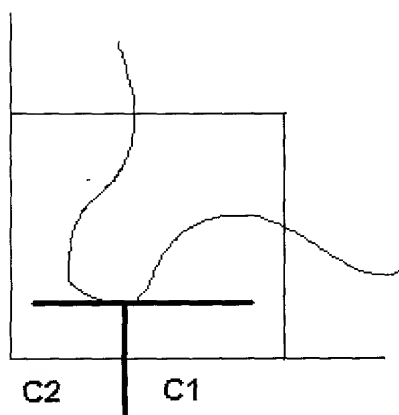
Figure 3D

108090" E869/860



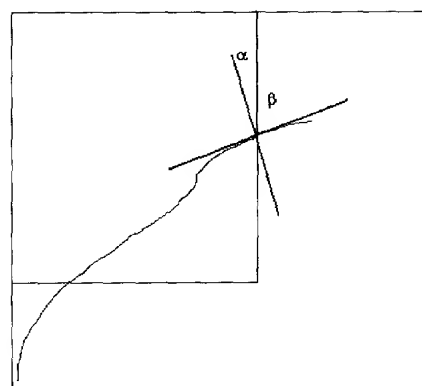
The situation of Lemma 1

Figure 4A



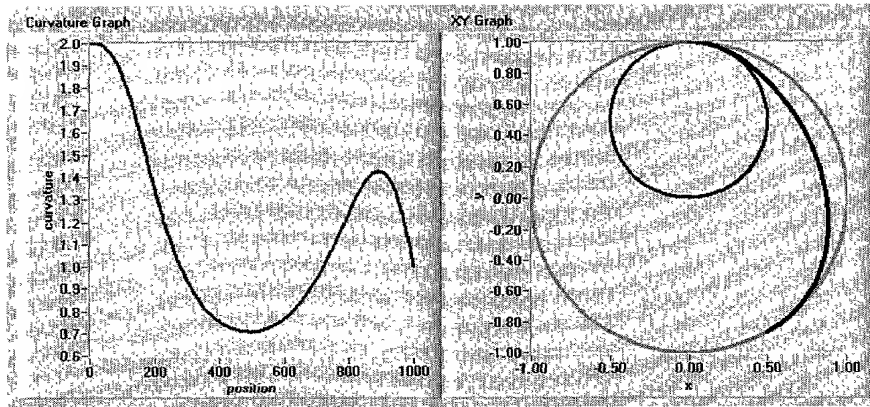
Case (A)

Figure 4B



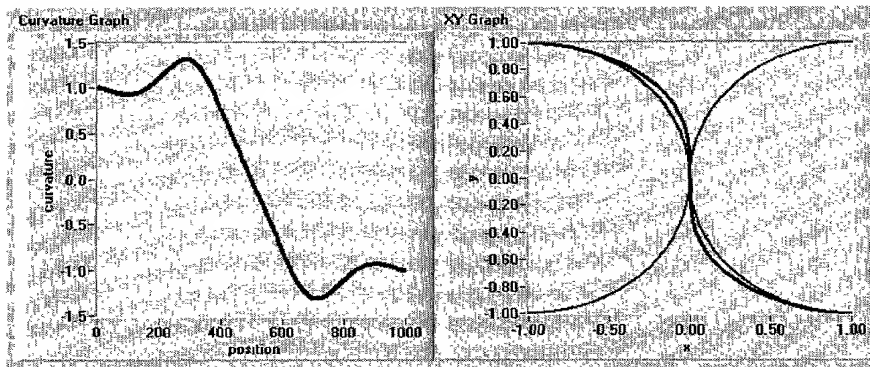
Case (B)

Figure 4C



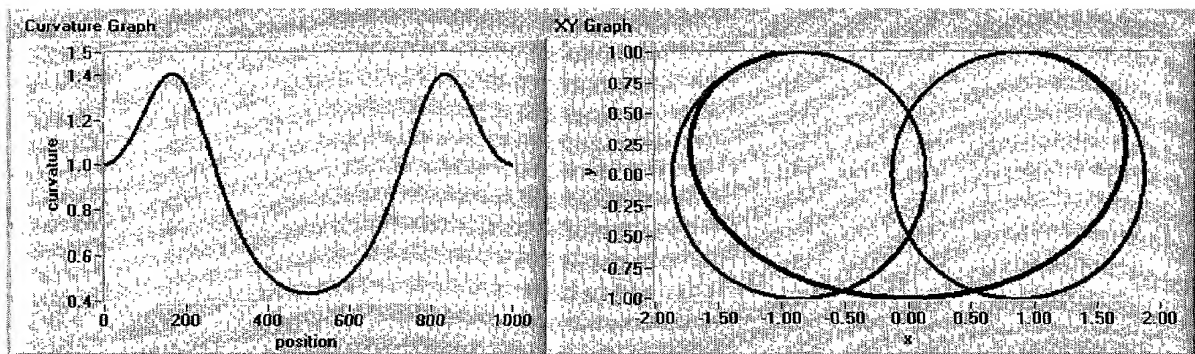
Smooth transition between two circles of different radii.

Figure 4D



Smooth transition between two circles of same radius.

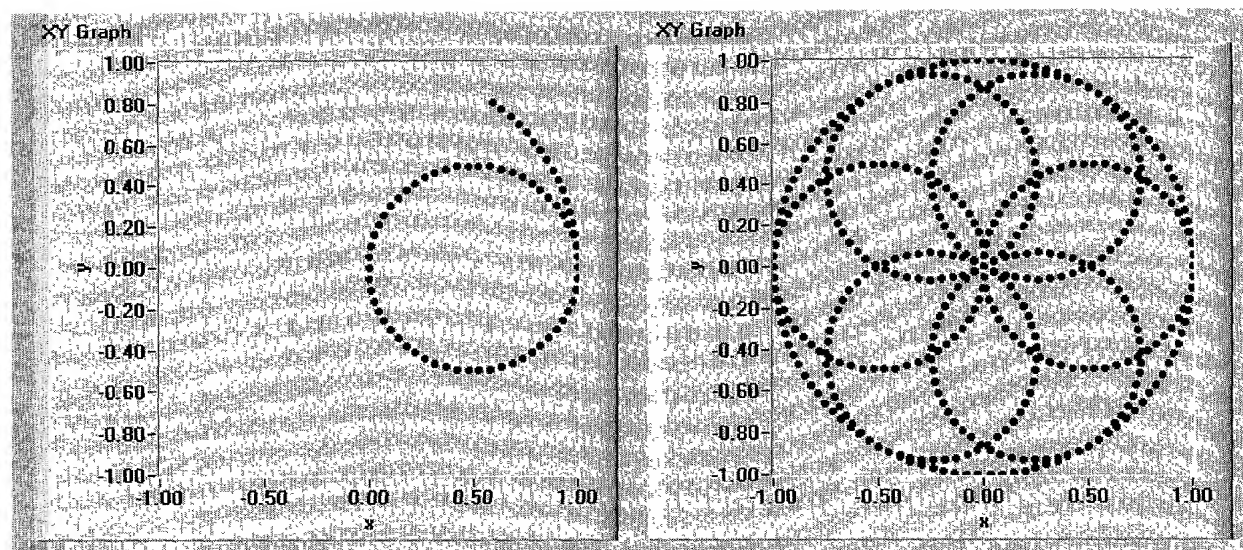
Figure 4E



Transition between two unit circles of radius 1. The distance between the circles is $\sqrt{3}$

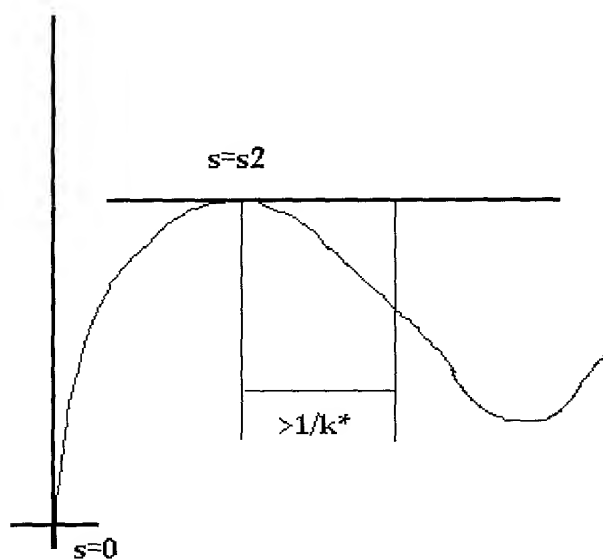
Figure 4F

09375983.060801
T08090" E8697860



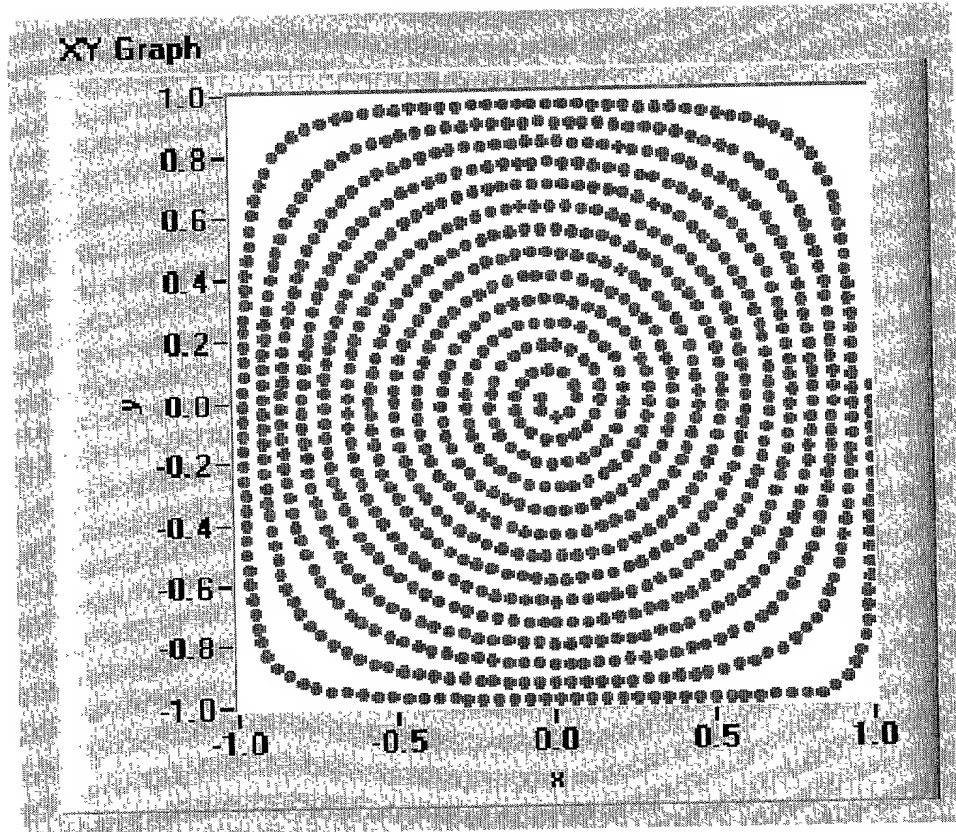
Beginning (left) and completion (right) of a scanning scheme where the curvature is below a certain value

Figure 5A



Construction of s_2 and the subsequent part of the curve

Figure 5B



Conformal Spiral.

Figure 6

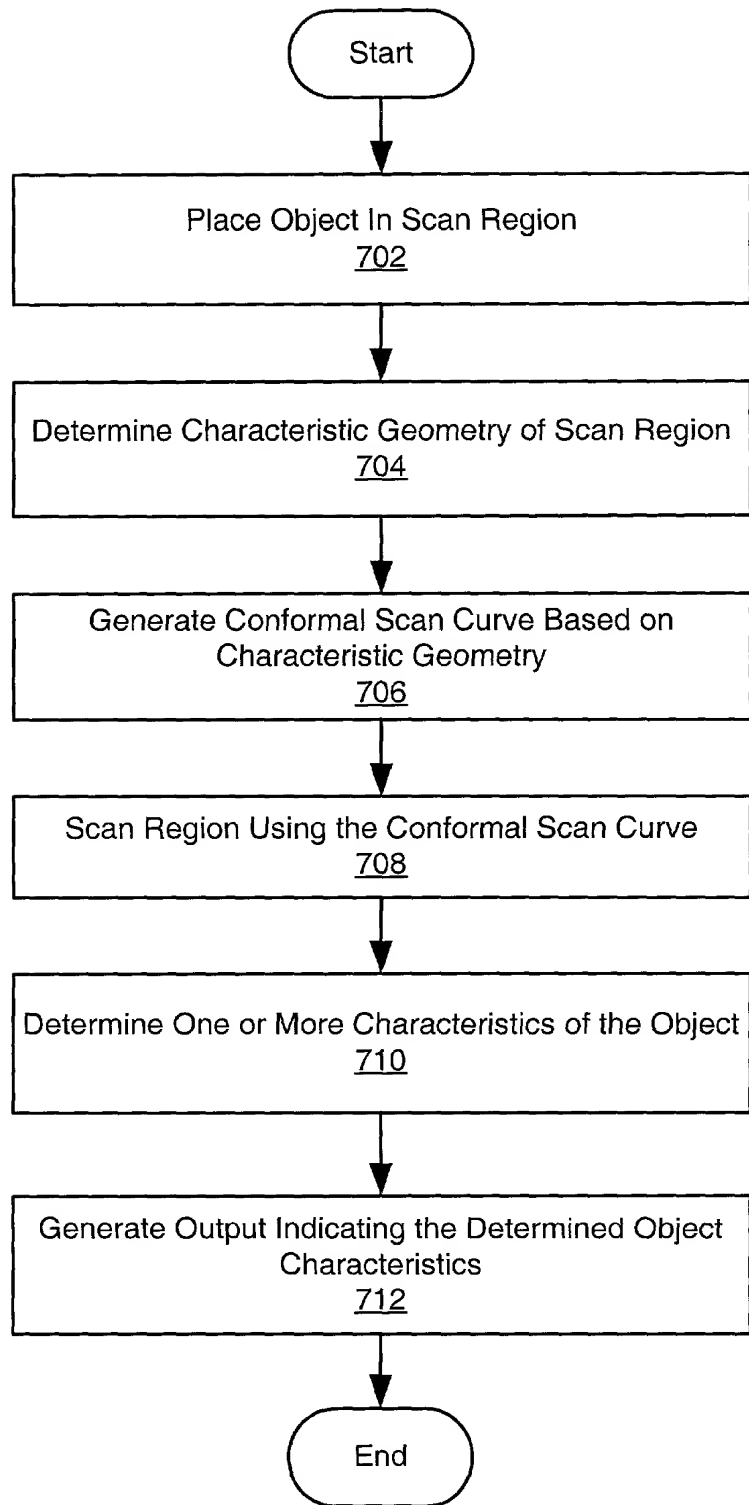
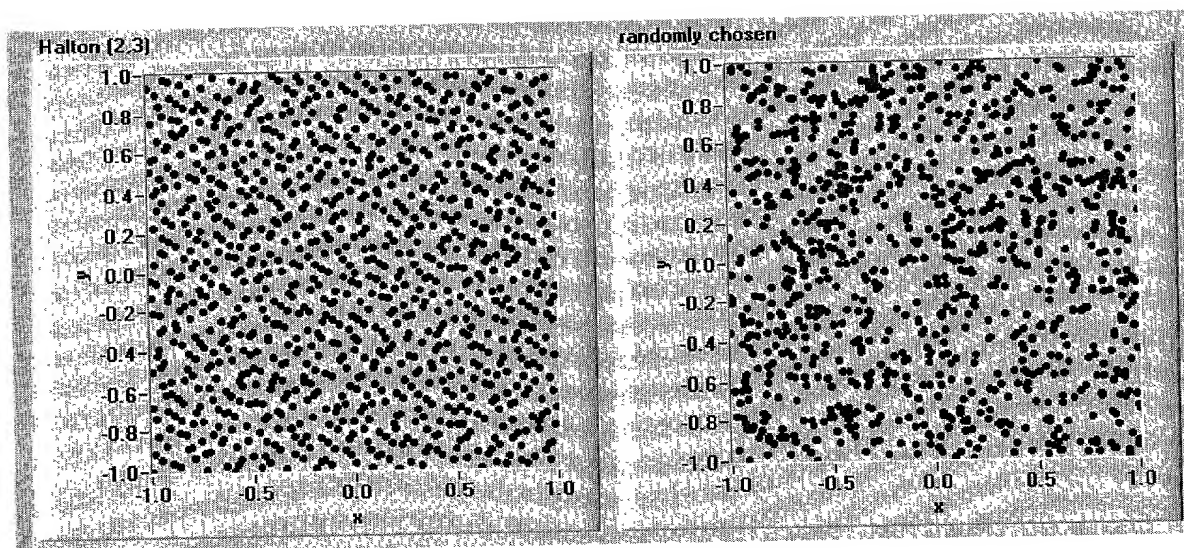
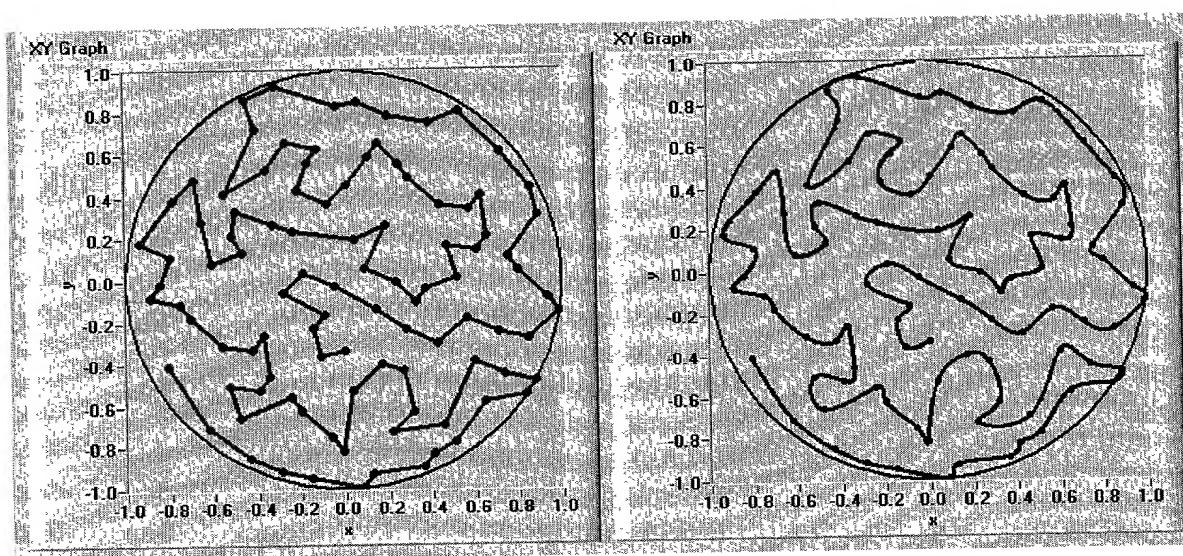


Figure 07



The first 1000 Halton points (left) and randomly chosen points (right)

Figure 8A



Original solution (left) and splined version (right).

Figure 8B

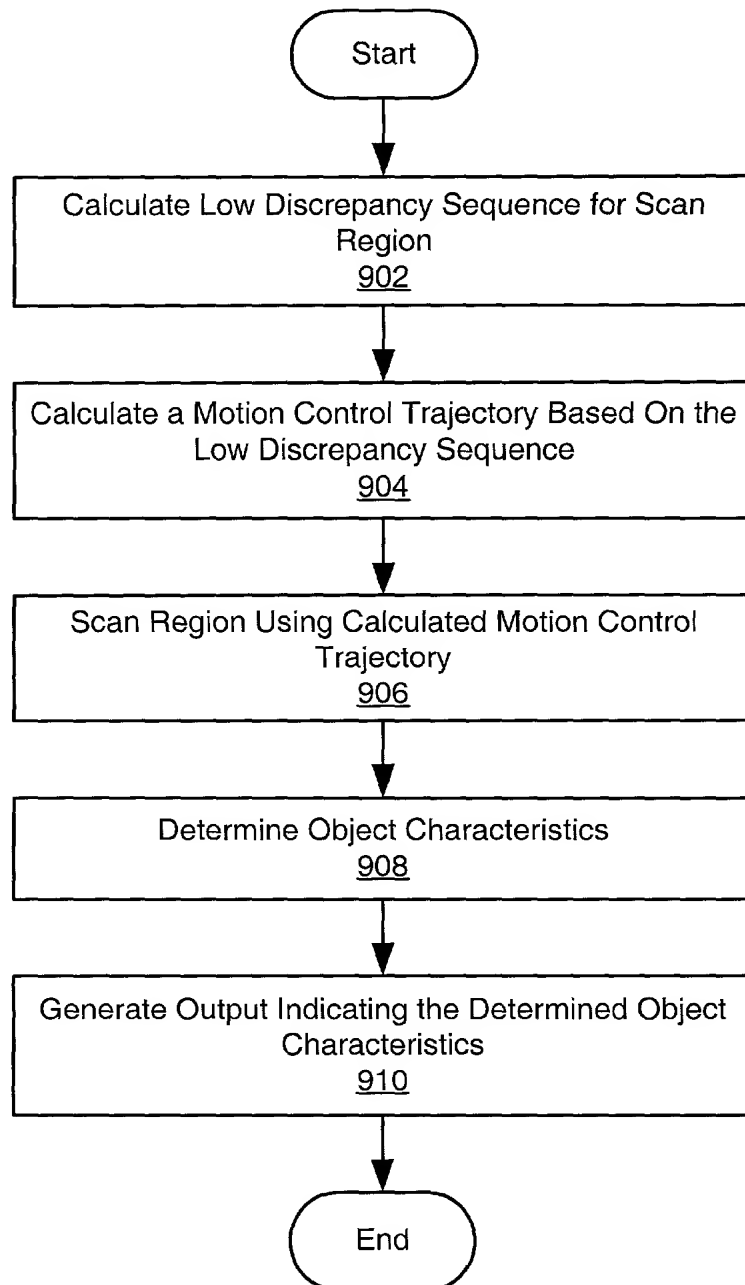
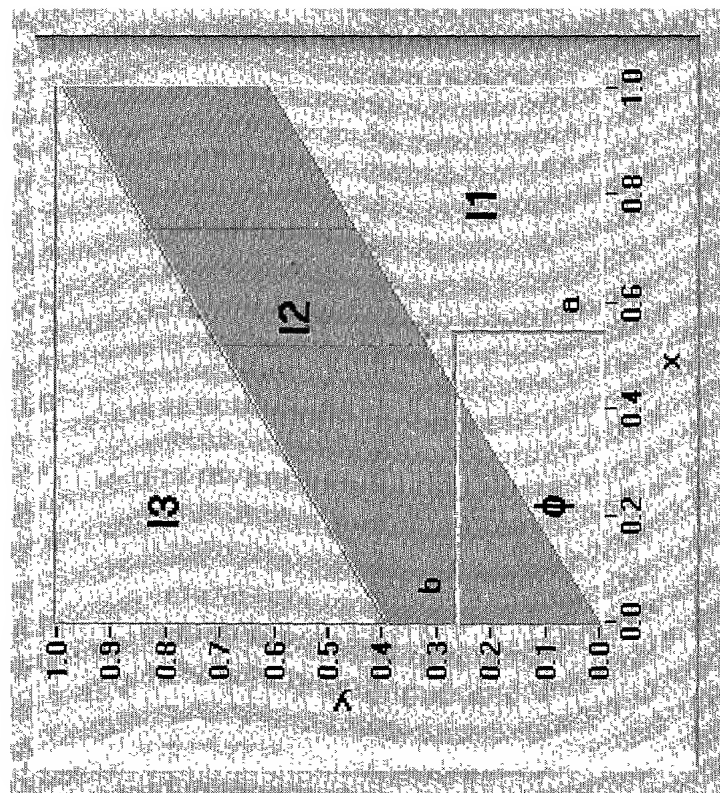


Figure 9



Definition of I_1 , I_2 , and I_3

Figure 10

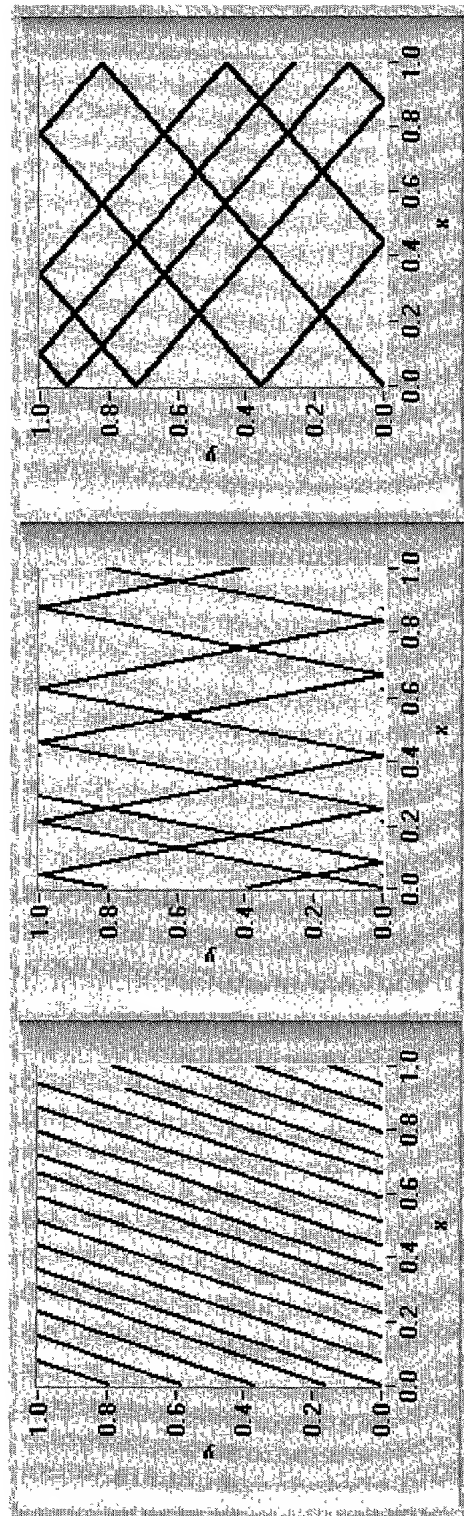


Figure 11A

Figure 11B

Figure 11C

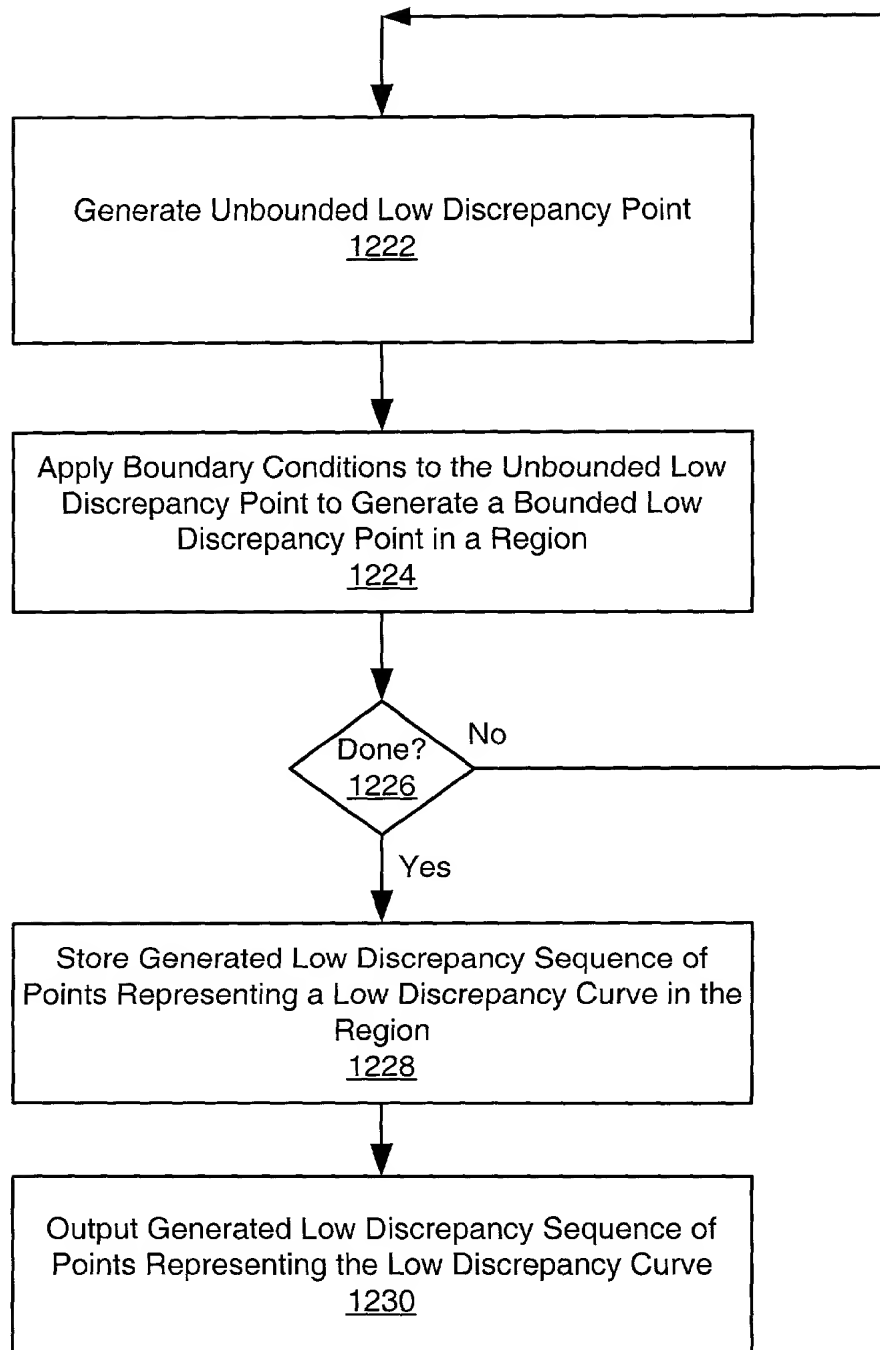


Figure 12A

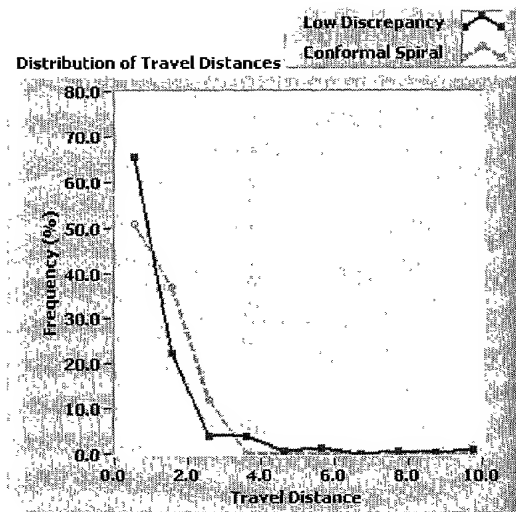
```

graph TD
    1202[Select a Pair of Irrational Numbers (alpha1,alpha2) such that the Sequence  $\{(n \cdot \alpha_1) \bmod 1\}, \{(n \cdot \alpha_2) \bmod 1\}$  for all Natural Numbers n is a LDS in the Unit Square.  
1202] --> 1204[Select a Length, L, and a Step Rate, epsilon, of the LD Curve in the Unit Square  
1204]
    1204 --> 1206[Initialize Current Length, l, to Zero, and Initialize Current Position (x,y), (e.g., to (0,0))  
1206]
    1206 --> 1208[Increment x and y and Apply Boundary Conditions at Borders of Unit Square (e.g., Toroidal, Reflectance, or Both), Generating a Low Discrepancy Sequence Point  $(x_n, y_n)$   
1208]
    1208 --> 1210{Is l < L?  
1210}
    1210 -- Yes --> 1212[Output Generated Low Discrepancy Sequence of Points Representing the Low Discrepancy Curve  
1212]
    1210 -- No --> 1208
  
```

Figure 12B

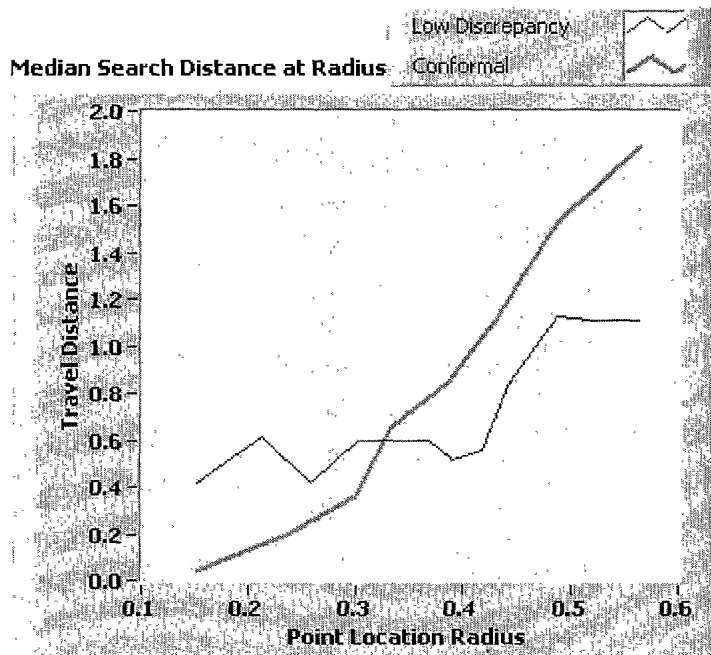
Figure 1 is a plot titled "Coarse Search Path". The x-axis and y-axis both range from 0.0 to 1.0, with major grid lines every 0.1 units. The plot shows a search path starting at the origin (0,0). The path moves to (0.5, 0.5), then to (0.2, 0.8), and finally to (0.1, 0.9). The path is composed of several connected line segments.

Figure 13B



Comparison of Conformal Spiral and Low Discrepancy Searching

Figure 13C



Comparison of Travel Distance for Low Discrepancy Search and Conformal Spiral Search

Figure 13D

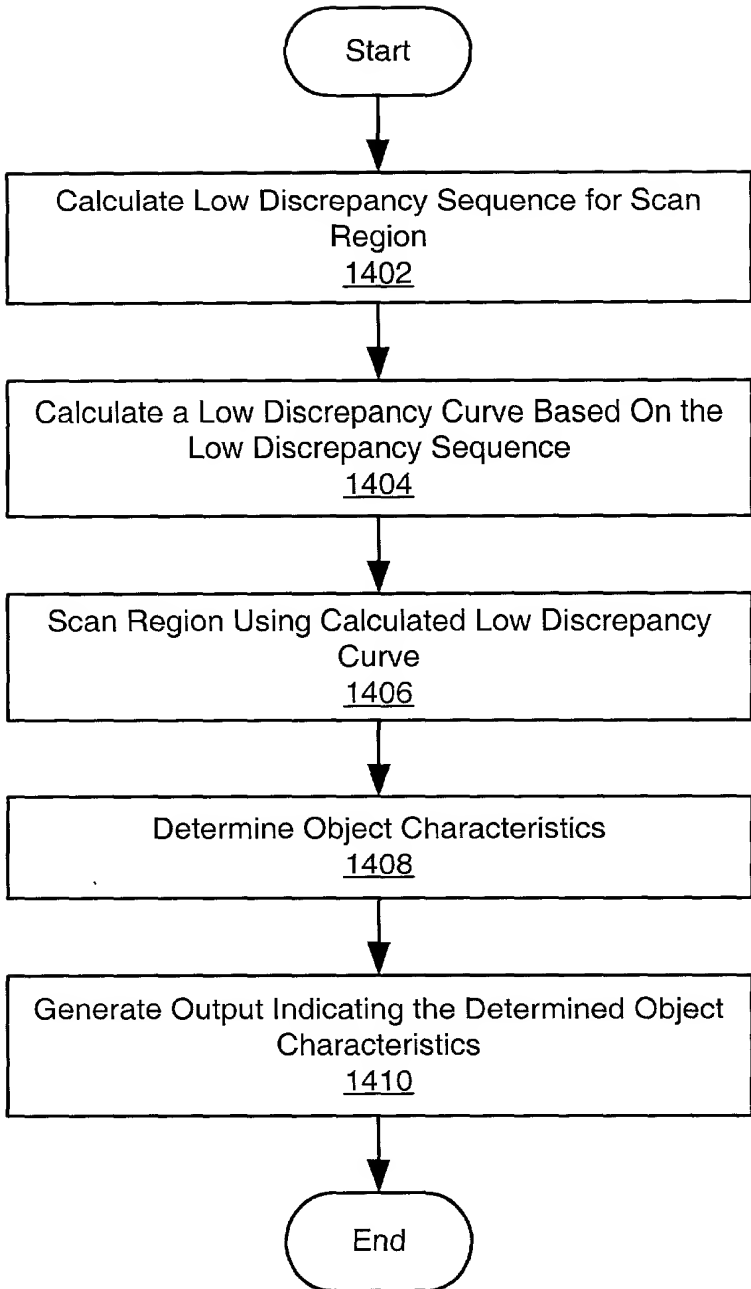
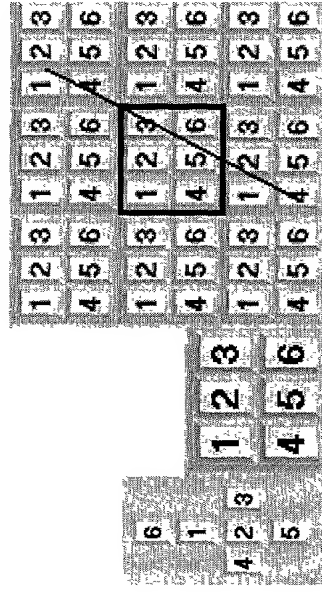
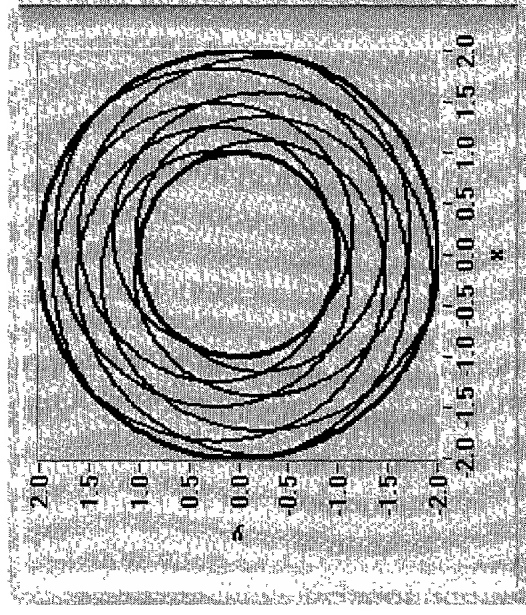


Figure 14

T08090" E3694860



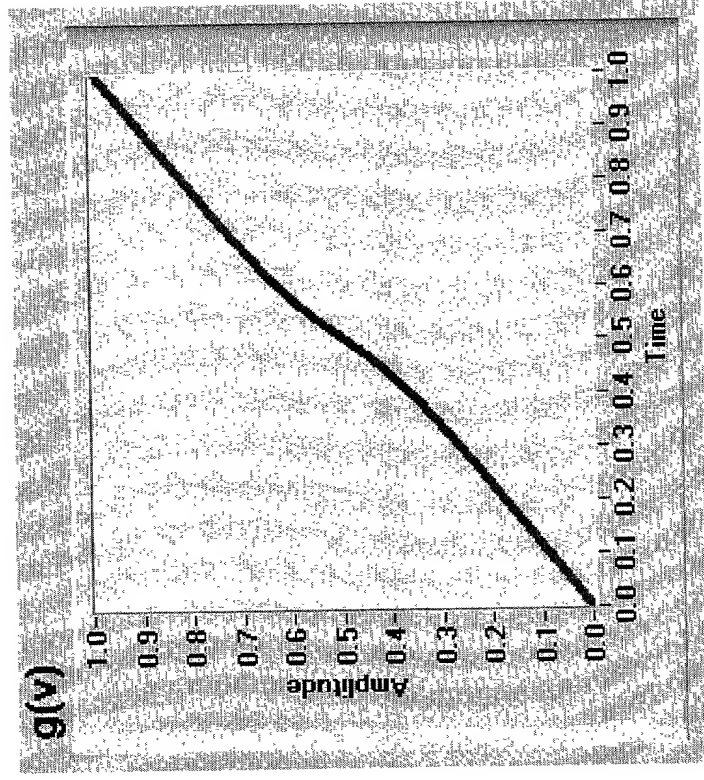
Tiling of the plane and relation to the surface of the unit cube



Low-discrepancy curve in a ring

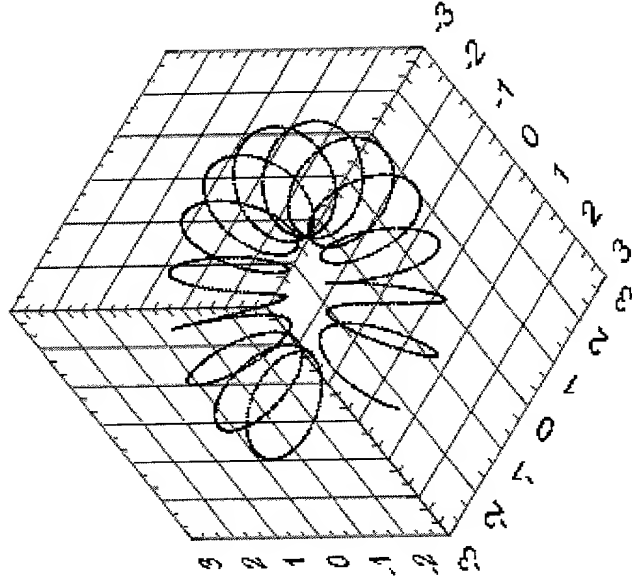
Figure 15A

Figure 15B



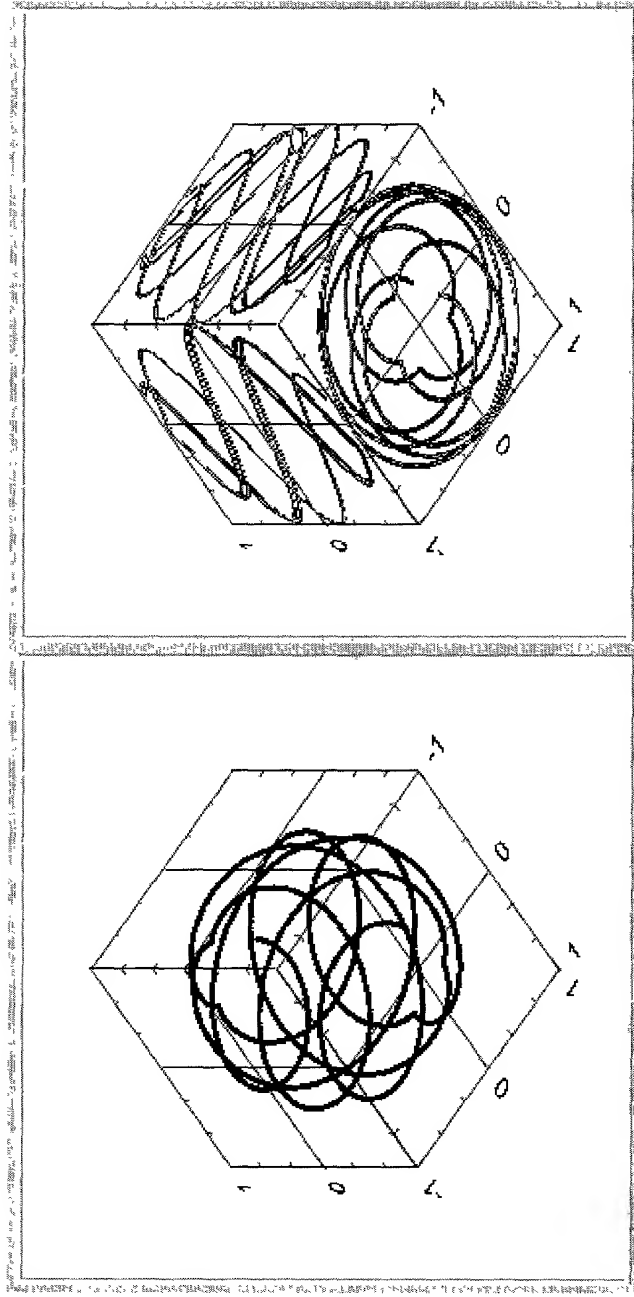
Low Discrepancy Preserving Mapping Function

Figure 15C



Low-discrepancy curve filling the surface of a torus

Figure 15D



Low-discrepancy curve on a sphere
(left) and projections (right)

Figure 16

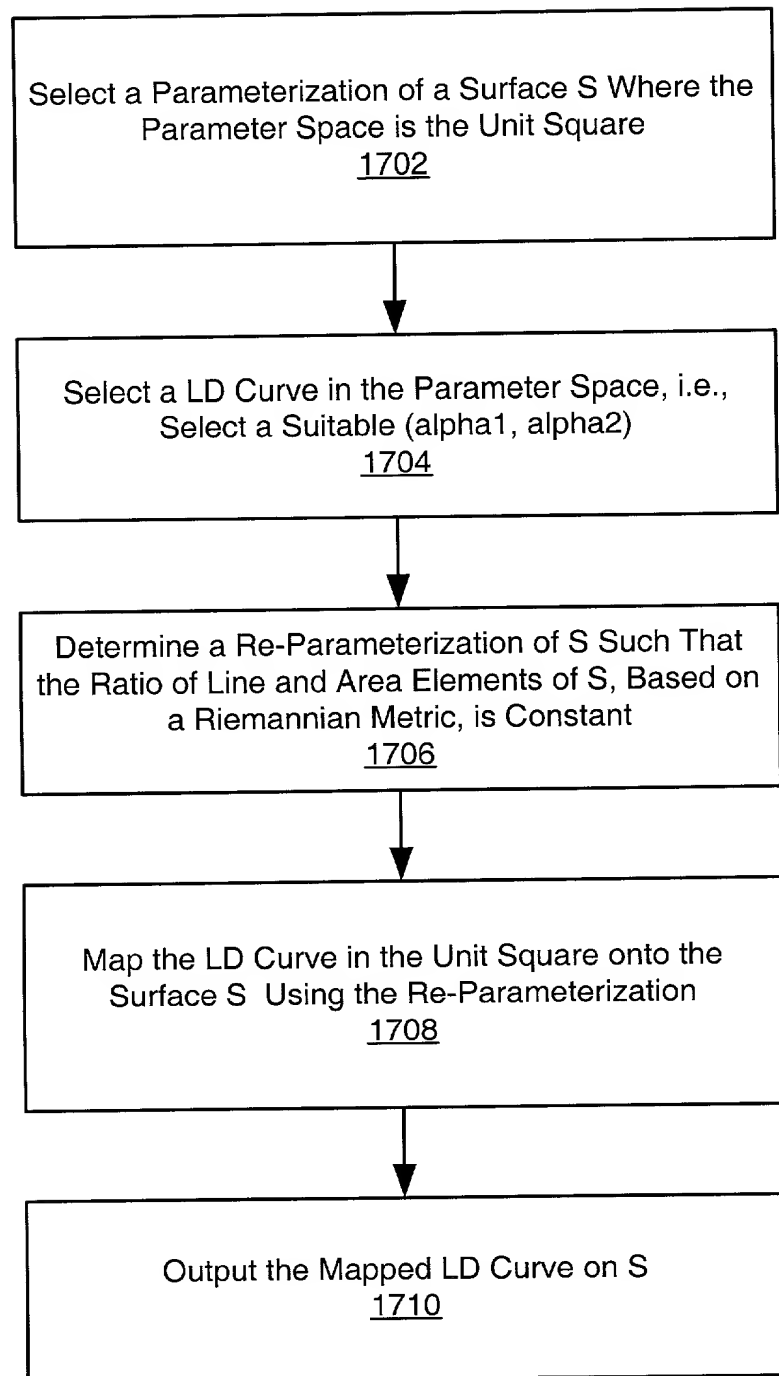
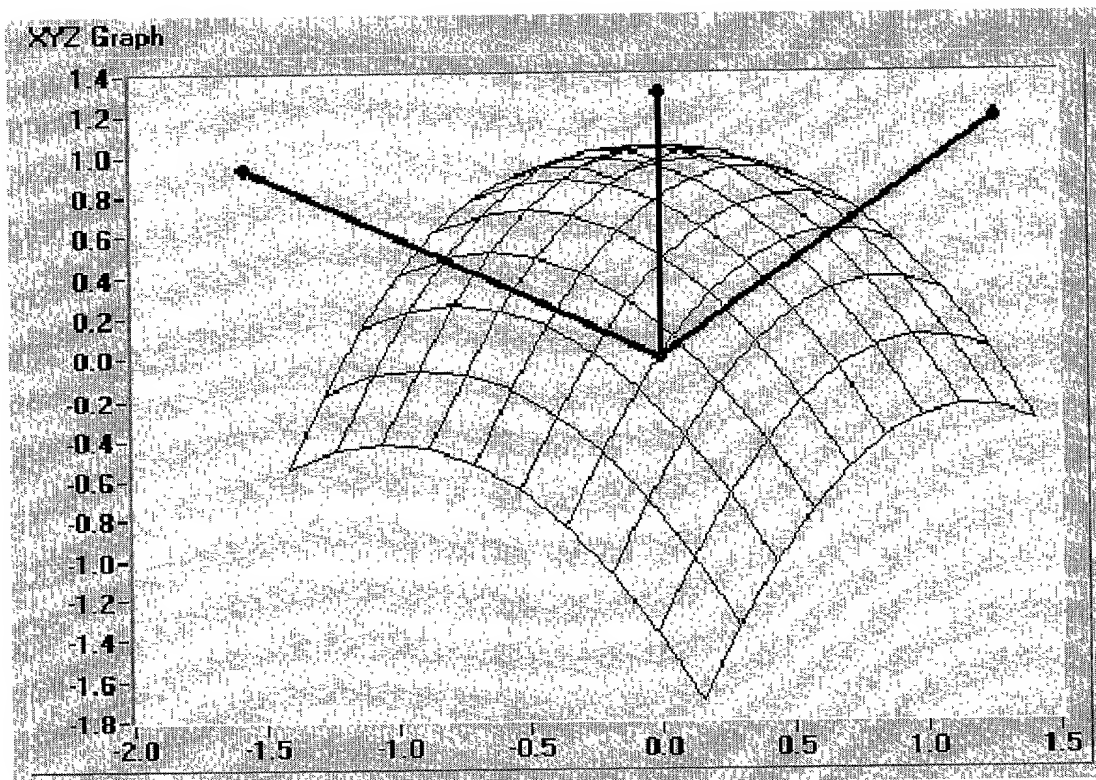


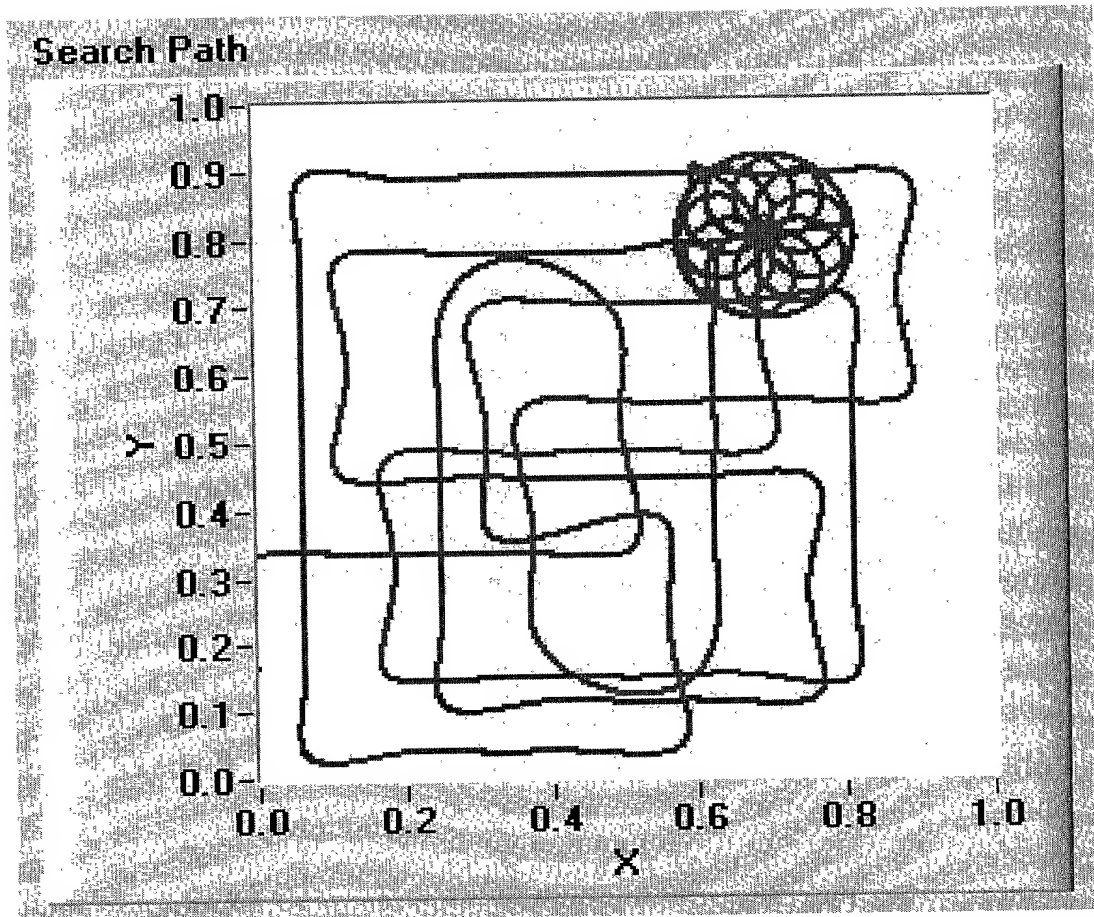
Figure 17



Surfaces can be scanned efficiently when the term low discrepancy sequence/curve can be generalized, e.g. based on metrics on the surface.

Figure 18

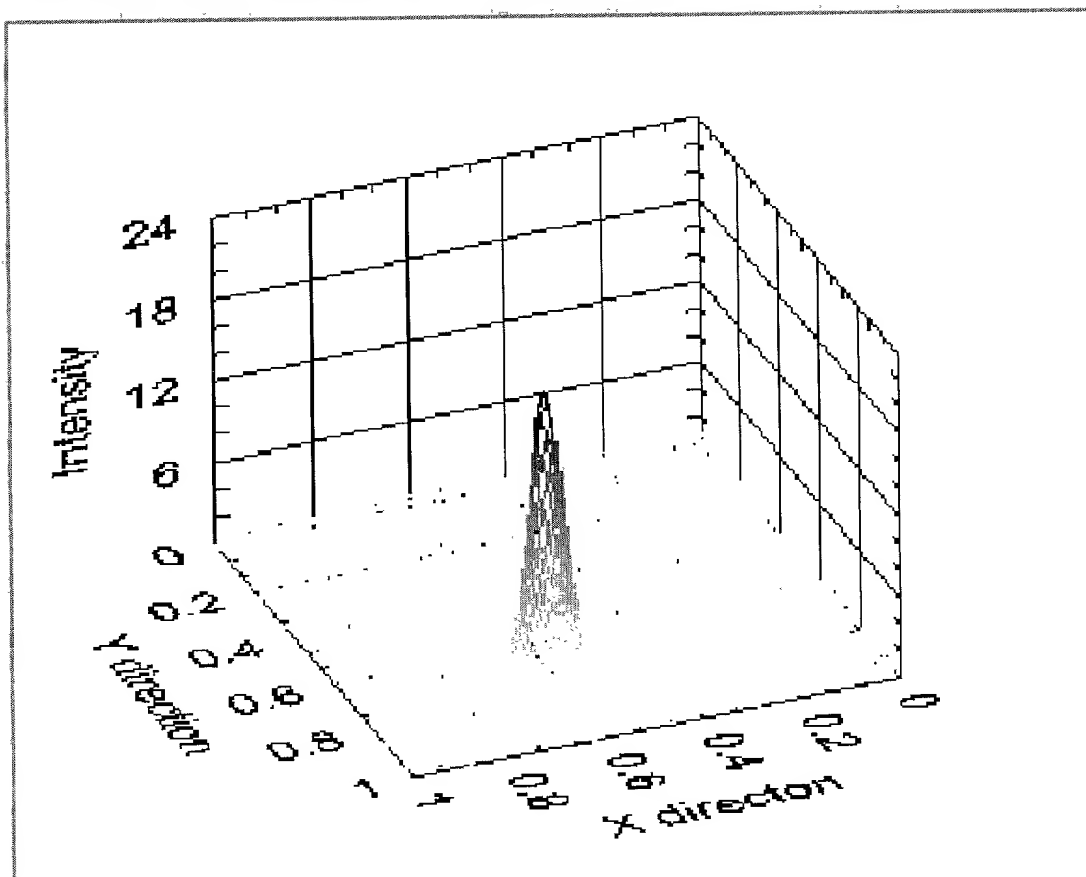
T03090" E8697860



Splined Low Discrepancy Curve coarse search with refined final approach

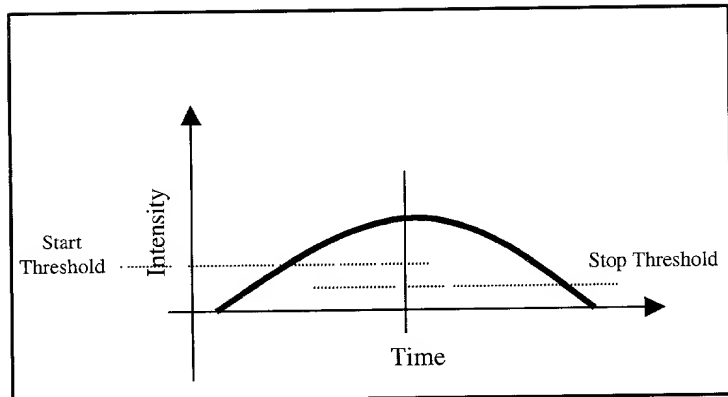
Figure 19

Intensity Field Distribution in Search Area

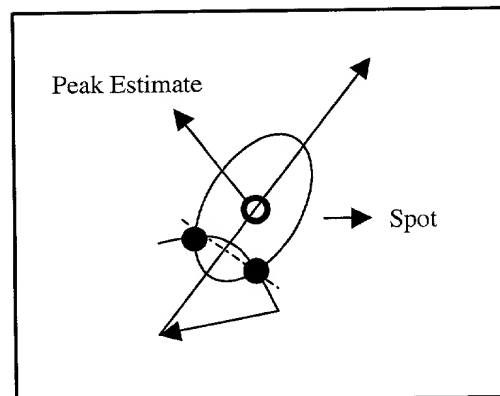


Beam intensity distribution in search area

Figure 20



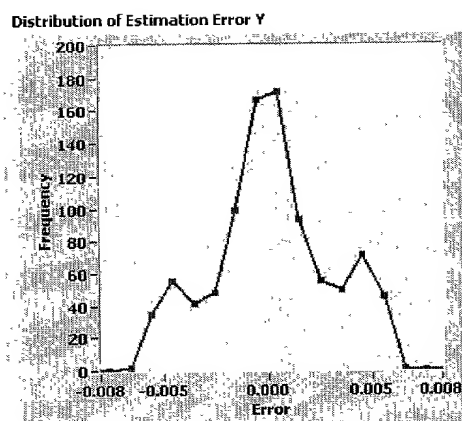
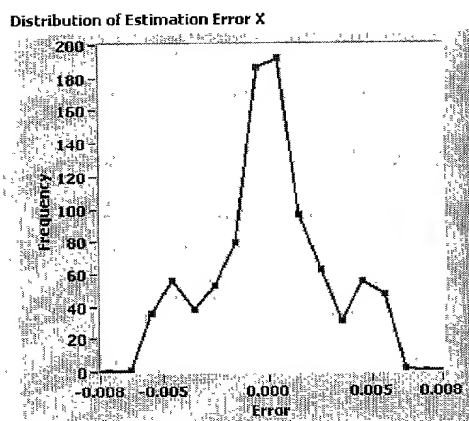
Location of the Peak



Initial Final Approach Move

Figure 21A

Figure 21B



Error distribution of the estimated peak X coordinate error (left) and Y coordinate error (right)

Figure 21C

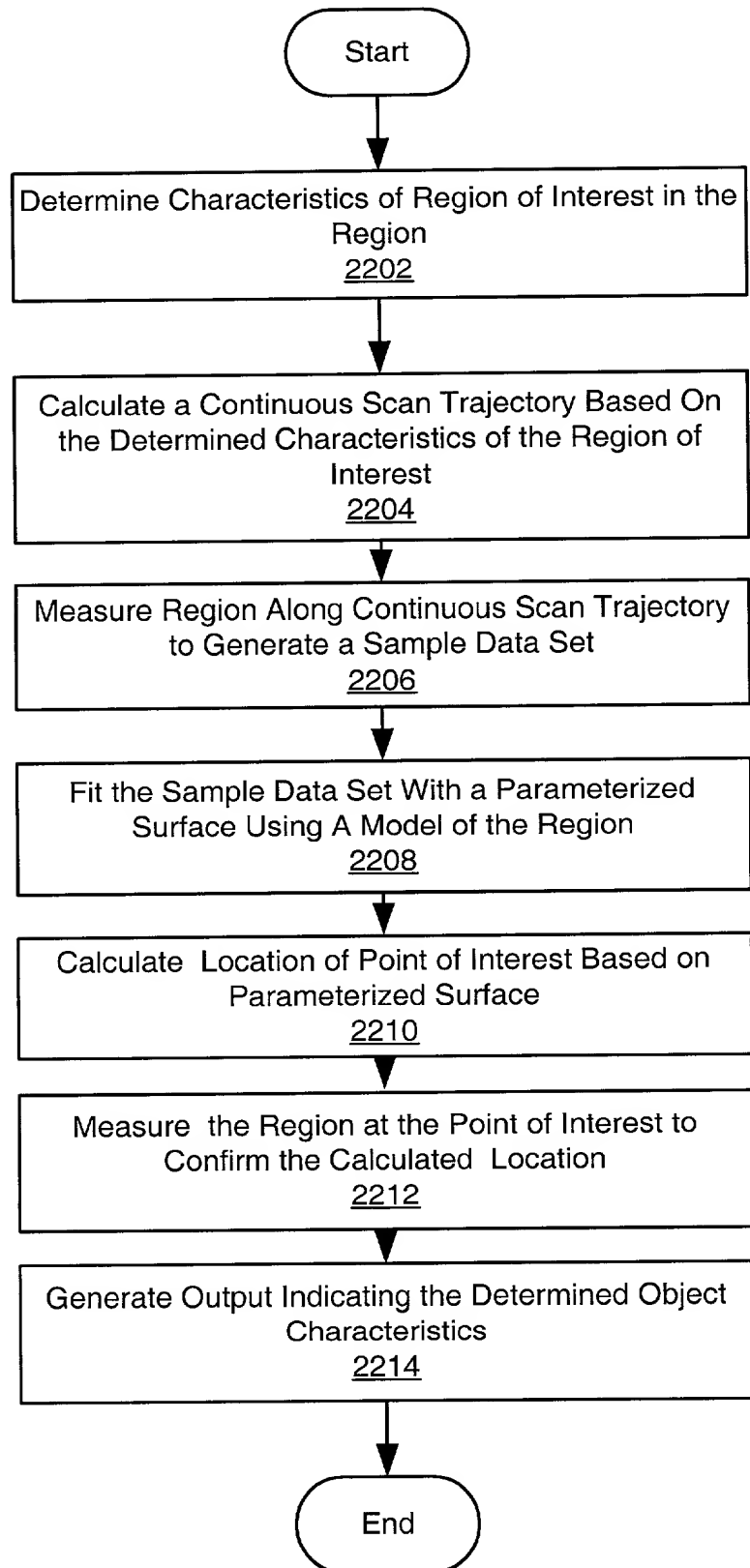


Figure 22

09076983-060801
T02090" 28692860

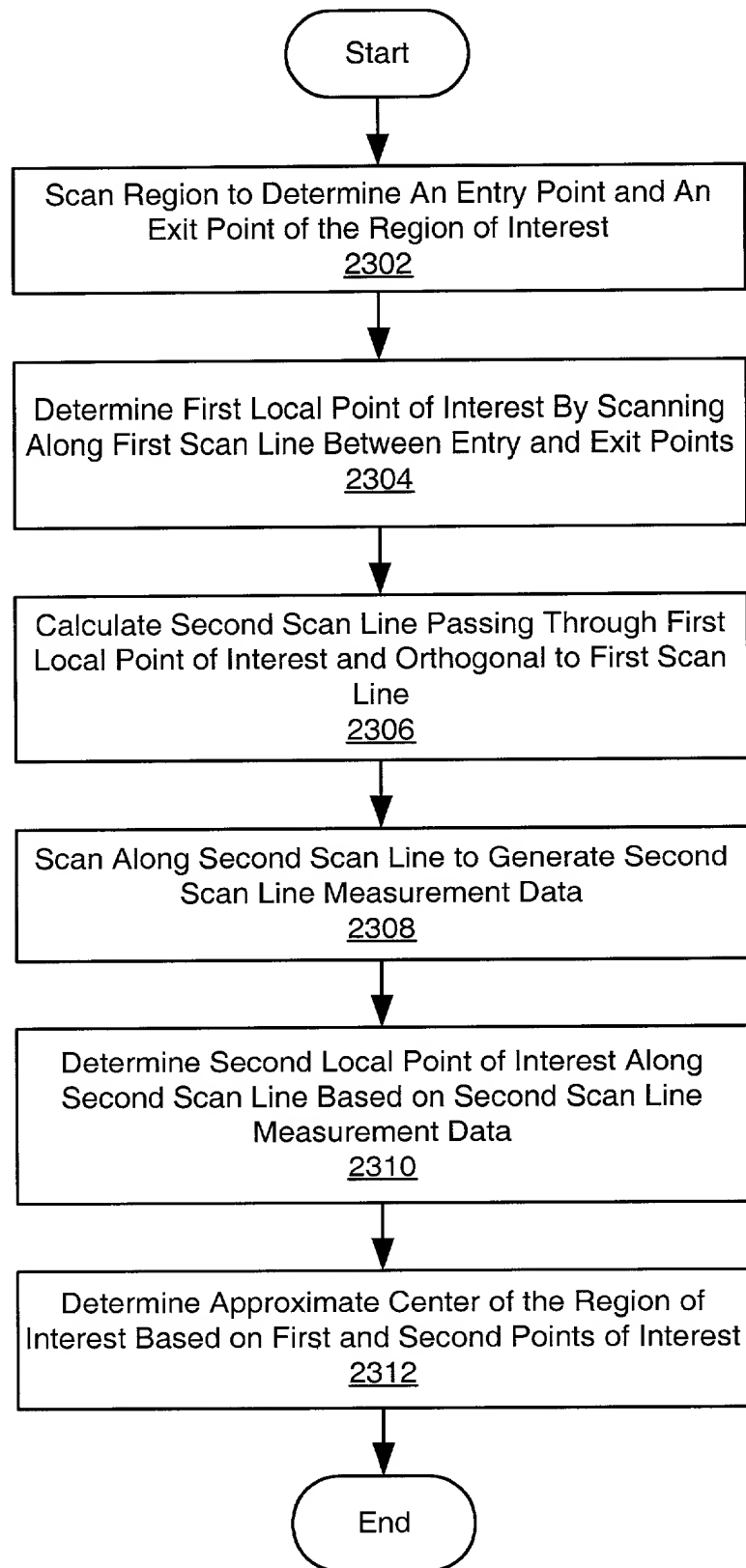


Figure 23